FUEL PROCESSOR AND METHOD FOR GENERATING HYDROGEN FOR FUEL CELLS

ABSTRACT OF THE DISCLOSURE

A method of producing a H_2 rich gas stream includes supplying an O_2 rich gas, steam, and fuel to an inner reforming zone of a fuel processor that includes a partial oxidation catalyst and a steam reforming catalyst or a combined partial oxidation and stream reforming catalyst. The method also includes contacting the O_2 rich gas, steam, and fuel with the partial oxidation catalyst and the steam reforming catalyst or the combined partial oxidation and stream reforming catalyst in the inner reforming zone to generate a hot reformate stream. The method still further includes cooling the hot reformate stream in a cooling zone to produce a cooled reformate stream. Additionally, the method includes removing sulfur-containing compounds from the cooled reformate stream by contacting the cooled reformate stream with a sulfur removal agent. The method still further includes contacting the cooled reformate stream with a catalyst that converts water and carbon monoxide to carbon dioxide and H_2 in a water-gas-shift zone to produce a final reformate stream in the fuel processor.